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AUG 29 1950

Washington 25, D. C. August 1950

NEW ENGLAND SINK GILL NET

By Boris O. Knake*

Introduction

The "Gill Net" is a type of gear for catching fish which can be traced back to prehistoric times and yet still maintains a place of importance in world fisheries today.

This paper deals primarily with the "Sink Gill Net" used in New England and designed to catch groundfish (codfish, haddock, and pollock). These fish are caught near the floor of the ocean on the New England fishing banks at a depth of 20-40 fathoms and up to 10-35 miles offshore.

Gill net operations are carried out during periods of fair weather. The season starts in early April and continues until late June. It is again resumed in September and generally lasts through December.

Gill netting on the northeastern seacoast of New England had its inception back in the late 1870's. In the years 1908 and 1910 gill netting formally got under way. At one time Gloucester operated over 54 gill netters. Today only six remain in operation.

In 1940 sink gill nets brought into the port of Gloucester over 10 million pounds of groundfish. The catch gradually declined until in 1945 it amounted to only 7,500,000; 1946 - 7,209,863; 1947 - 6,391,209; 1948 - 4,983,734; and 1949 - 4,139,500 pounds.

The largest catch reported at Gloucester by a gill netter was about 35,000 haddock for one string of gear. The usual catches, however, are much smaller, ranging from 3,000 to 5,000 and occasionally a catch of 7,000. The main species, as far as dollar return to the fishermen is concerned, is codfish with the bulk of the catch being pollock, which sells for far less. The haddock catches are very small.

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Construction and Operation

Construction of gill nets differs according to the physical nature of the localities in which they are used and the type and habits of the fish which are being sought.

The gill net is a webbing suspended vertically in the water by means of floats on the top line and held downward by weights on the bottom line to act as a portable barrier. The net is set in such a manner that it intercepts the school of fish in a particular area. It is reasonable to assume that a school of fish would regard the net in the water as they would any drifting seaweed through which they swim.

Theoretically the fish (Figure 1-A) going through the net mesh is caught when the open area of the mesh is of a specific size in relation to the fish. Thus the head of the fish is allowed to enter through the net (Figure 1-B) but cannot pass beyond the dorsal fin and the point of greatest girth. (Figure 1-C). At this point the fish will try to free itself by twisting and wiggling with the gill flaps open. The twine of the mesh slides under the gill covers and the fish can no longer free itself (Figure 1-D) unless it is able to break the twine. The bulk of the fish is caught in this manner, but occasionally fish become entangled in the fine twine of the gill net webbing in the area around the fins or snout and sometimes only by the scales of the fish.

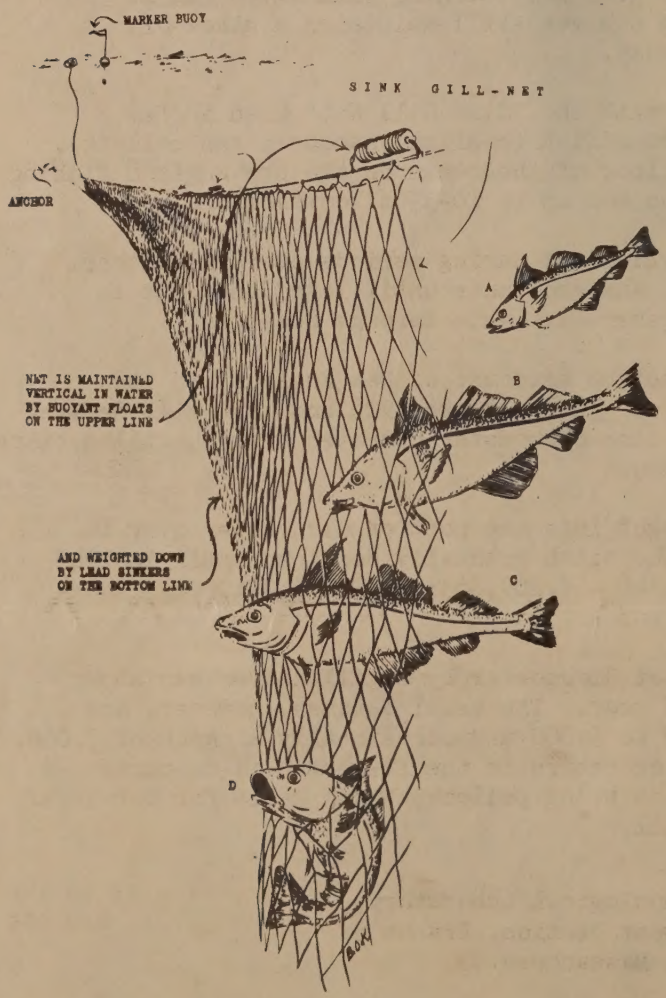

Fig. 1 - Gilling Action

When the method of capture is understood it can be seen that the webbing of gill nets must be carefully selected as to size and design for specific fishing in a given area.

The nets are made of selected fine linen twine which is usually treated

to assure long life (Figure 2). The net is made of 12/3 or 12/4 linen thread, 6" mesh for catching haddock and pollock (Figure 3) and of 16/4 and No. 5 linen thread of 8" mesh for catching codfish. These nets are made up in sections of about 110-115 fathoms in length. Two of these sections are tied together by a bowline hitch on the end bights and placed in a box (Figure 4) for convenient handling. Twelve to sixteen boxes make up a string and 3 strings constitute a complete sink-gill net or "set" for each boat. The crew consists of 6 or 7 men, 2 of whom are assigned in-shore duties while the rest put to sea.

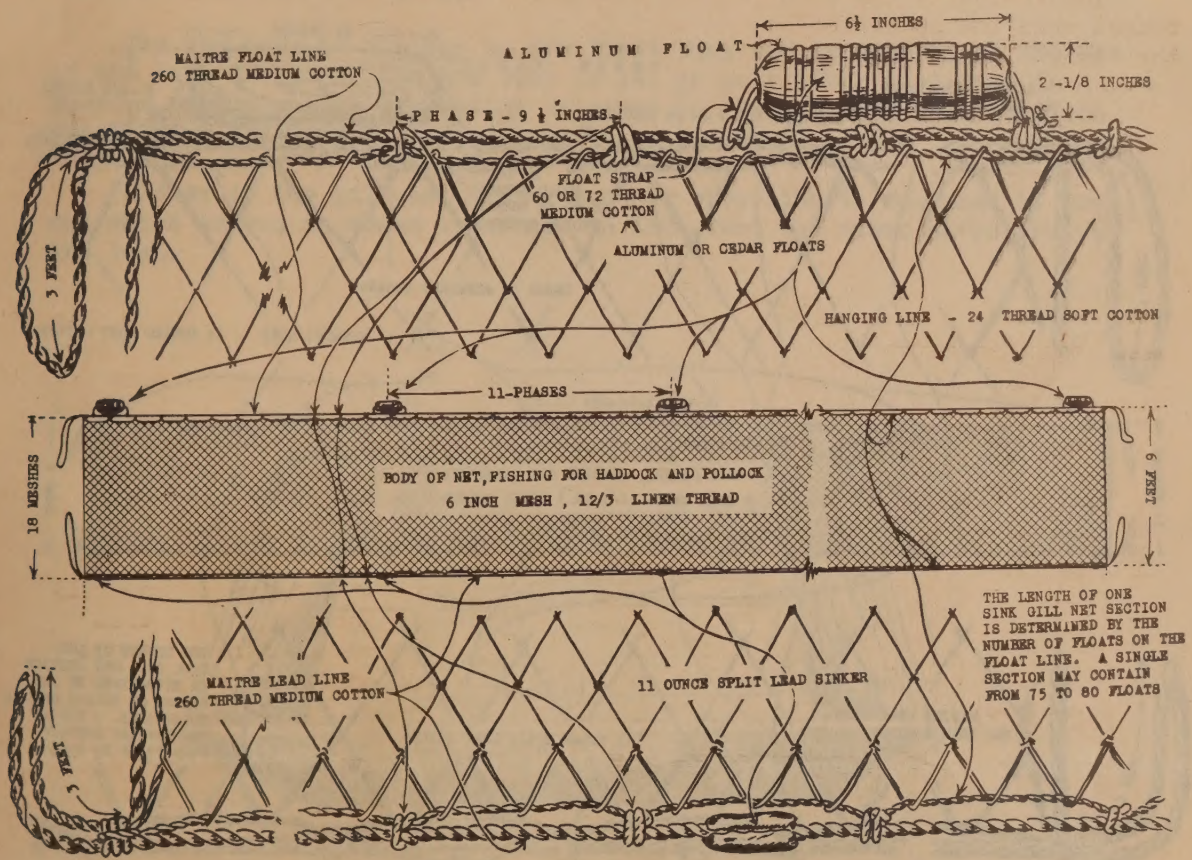
6½ INCHES
ALUMINUM FLOAT
MAITRE FLOAT LINE
260 THREAD MEDIUM COTTON
2 -1/8 INCHES
PHASE - 9 ½ INCHES
FLOAT STRAP
60 OR 72 THREAD
MEDIUM COTTON
ALUMINUM OR CEDAR FLOATS
3 FEET
HANGING LINE - 24 THREAD SOFT COTTON
11-PHASES
18 MESHES
BODY OF NET, FISHING FOR HADDOCK AND POLLOCK
6 INCH MESH , 12/3 LINEN THREAD
6 FEET
THE LENGTH OF ONE SINK GILL NET SECTION IS DETERMINED BY THE NUMBER OF FLOATS ON THE FLOAT LINE. A SINGLE SECTION MAY CONTAIN FROM 75 TO 80 FLOATS
MAITRE LEAD LINE
260 THREAD MEDIUM COTTON
11 OUNCE SPLIT LEAD SINKER
3 FEET

Fig. 2 - Construction of Haddock and Pollock Sink Gill Net

Sink-gill net fishing is carried out as follows: One string is in the water fishing, one string is on board the boat for the replacement, and one string ashore for repairs and overhauling (Figure 5).

While ashore on the dock the gill net section from each box is reeled upon a specially constructed wooden reel (Figure 6) for drying and overhauling.

Most of the gill-net boats out of Gloucester are about 40-64' long with a hold capacity of 20,000-45,000 pounds of iced fish and driven by diesel engines of approximately 120 h.p. The vessels are fitted with specially constructed net lifters (Figure 7).

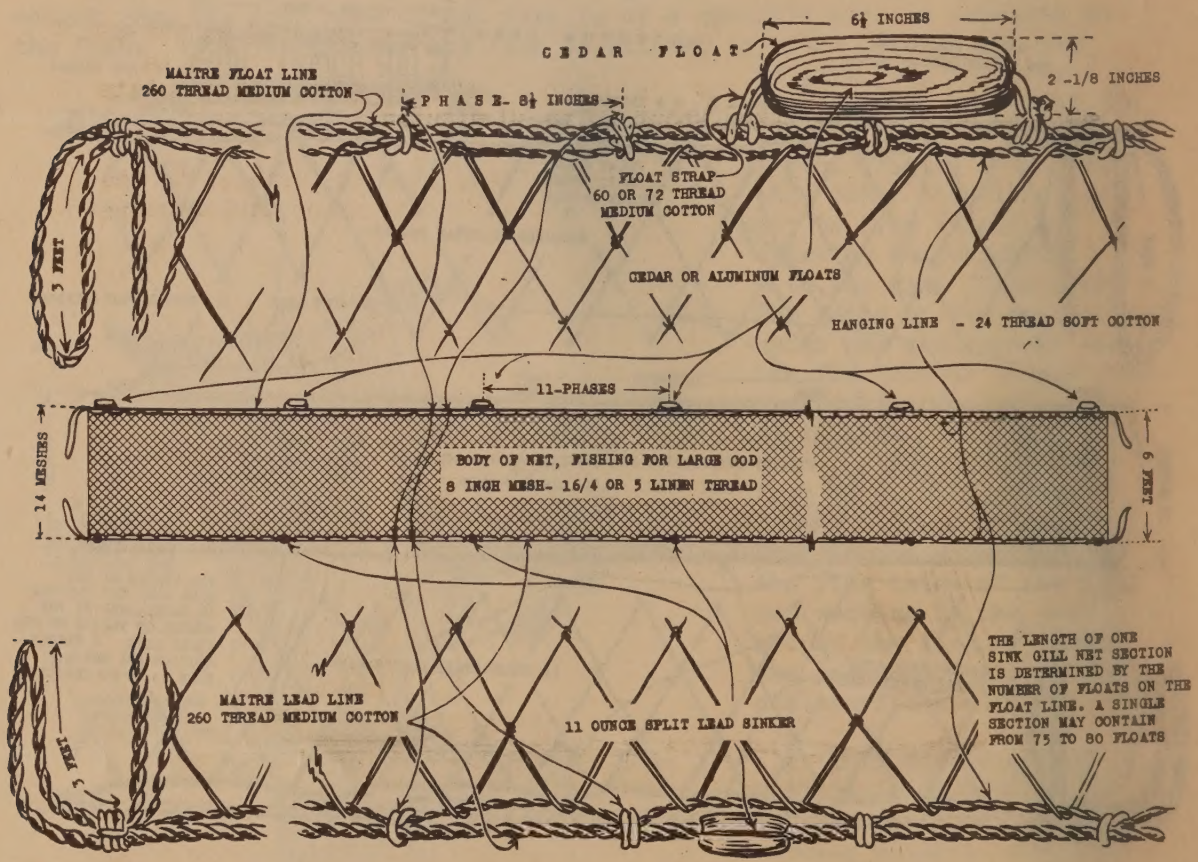

Fig. 3 - Construction of Cod Sink Gill Net

Setting Out Sink Gill Nets

The net is tied to the bridle which is secured at the anchor and the net sections are tied together by a bowline hitch.

The boat is directed in a predetermined course going ahead slowly (Figure 8). First the buoy is led out over the stern of the boat and the buoy line paid out followed by the anchor, net-bridle and the net. Net sections are connected in such a manner as that shown in Figure 9, from one box to the next so that it will run out of the boxes smoothly and in one continuous string.

The end buoy is similar to the first buoy and is secured at the end of the last section. The end buoy is let go only after a stretch is exerted on the entire net string in order to make it taut. To complete the setting of a string takes about 20 to 30 minutes.

Midway in the gill-net string another buoy line is fastened to the net which serves as added insurance in the event the other marker buoys are lost.

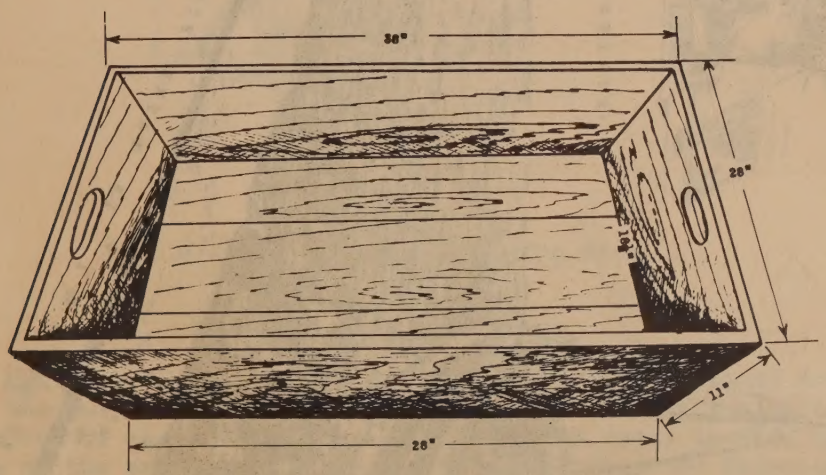

Fig. 4 - Typical Box for Storing Sink Gill Net on Deck

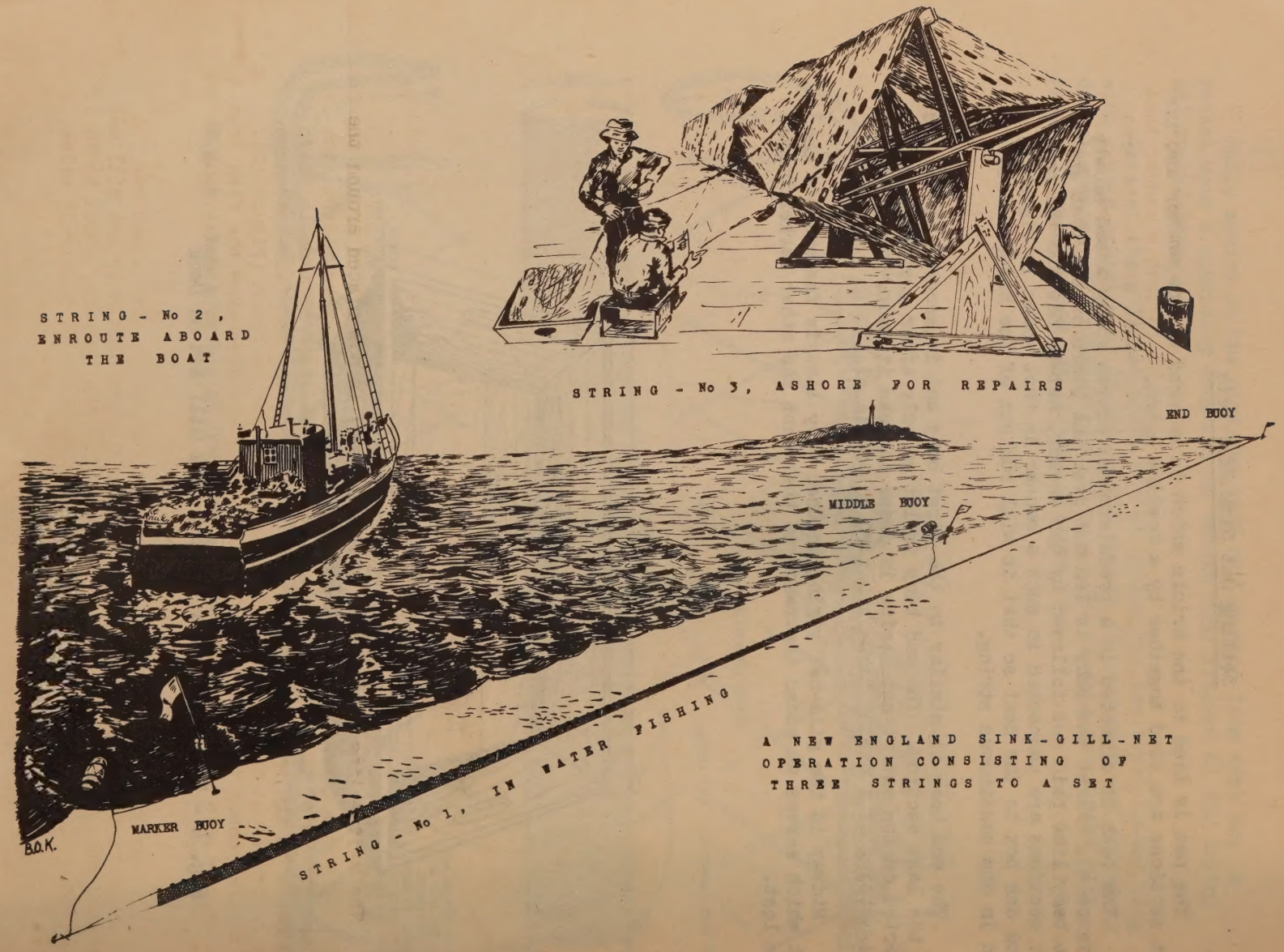

Fig. 5 - Showing Rotation of Nets

Hauling in the Net

When the ship arrives at the spot where the nets were set the day before, one of the net-end marker buoys is picked up in such a manner that the net string is to the windward, or if strong currents are in the area, the boat is headed toward the current. When the buoy is on board, the anchor is taken in by hauling on the buoy line. Next, the line of net bridles is hauled in until about a fathom of gill net is on board.

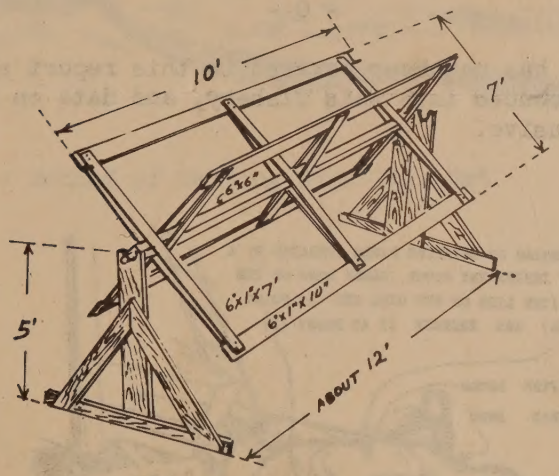

Fig. 6 - Wooden Reel for Drying Nets

The maitre line (float line and lead line) is now placed around the rotor of the automatic net lifter in such a manner that the maitre line is in the groove of the rotor pawls. A turn on the rotor is made to clamp the pawls on the maitre line; the net is placed over the fair-lead drum. The rotor is put in motion, thus hoisting the net on board (Figure 10). As the net comes in over the extension table, men disengage the fish from the meshes with the aid of pulsers (a wooden handle with a small hook at one end).

The net drops off the end of the extension table into a net box. A man is stationed at the end of the table to insure that only two gill net sections are placed in each box. It takes, on the average, about $2\frac{1}{2}$ to 3 hours to haul one string of gill net on board, which is nearly $3\frac{1}{2}$ miles long.

When large fish are caught, a man is stationed at the railing by the fair-lead and with the use of a gaff hook, which is stuck into the head of the fish, eases up the strain on the net webbing as it is lifted out of the water and over the fair-lead drum. When all the net has been lifted on board and the catch is favorable, the string of nets on the stern of the boat (which was overhauled by the shore-crew) is now prepared for setting. If the catch is too small, then another spot is selected.

Following this setting, the boat is headed for home and the crew start to dress the fish and stow them in the hold with crushed ice.

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Author's note: Nylon has not been covered in this report since it has only recently been introduced into this fishery, and data on its effectiveness are as yet inconclusive.

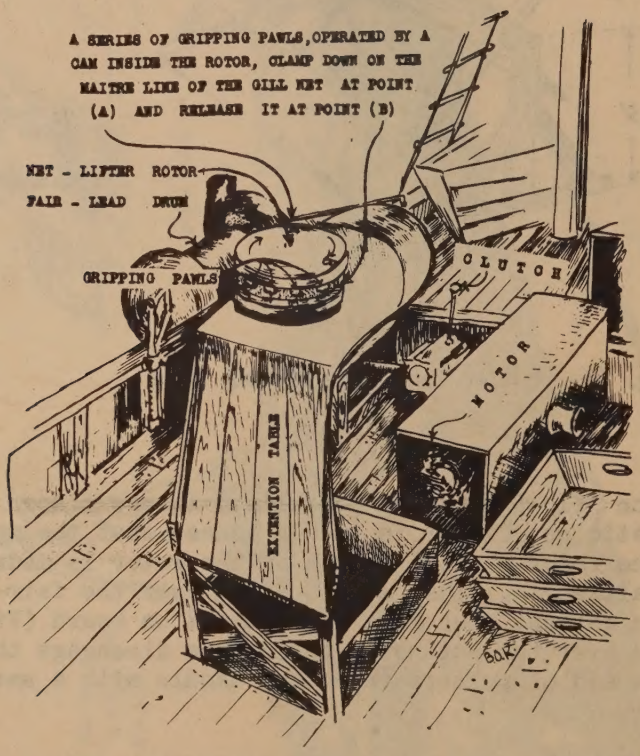
A SERIES OF GRIPPING PAWLS, OPERATED BY A CAM INSIDE THE ROTOR, CLAMP DOWN ON THE MAITRE LINE OF THE GILL NET AT POINT (A) AND RELEASE IT AT POINT (B)
NET - LIFTER ROTOR
FAIR - LEAD DRUM
GRIPPING PAWLS
CLUTCH
MOTOR
EXTENTION TABLE

Fig. 7 - Motor-driven Net Lifter

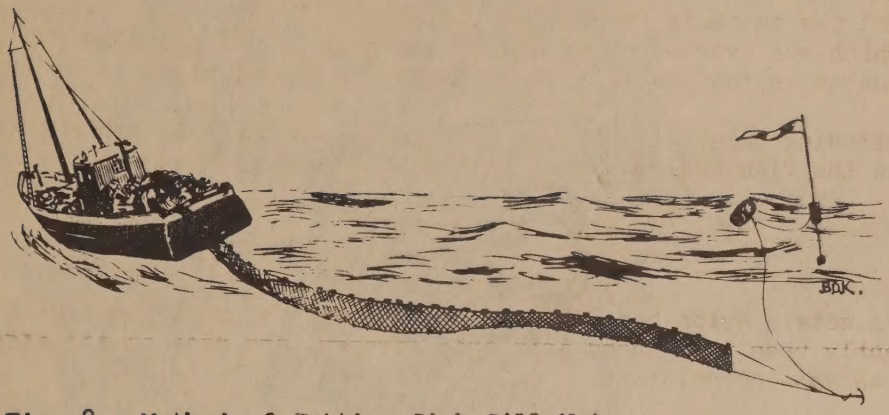

Fig. 8 - Method of Setting Sink Gill Net

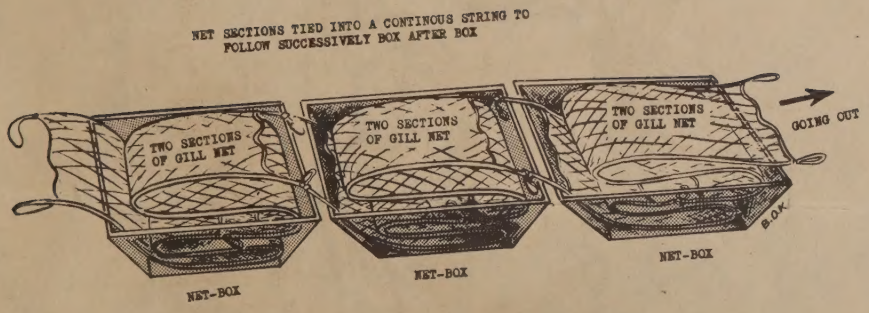

Fig. 9 - Usual 3 Box Set of Gill Nets

Interior--Duplicating Section, Washington, D. C. 80231

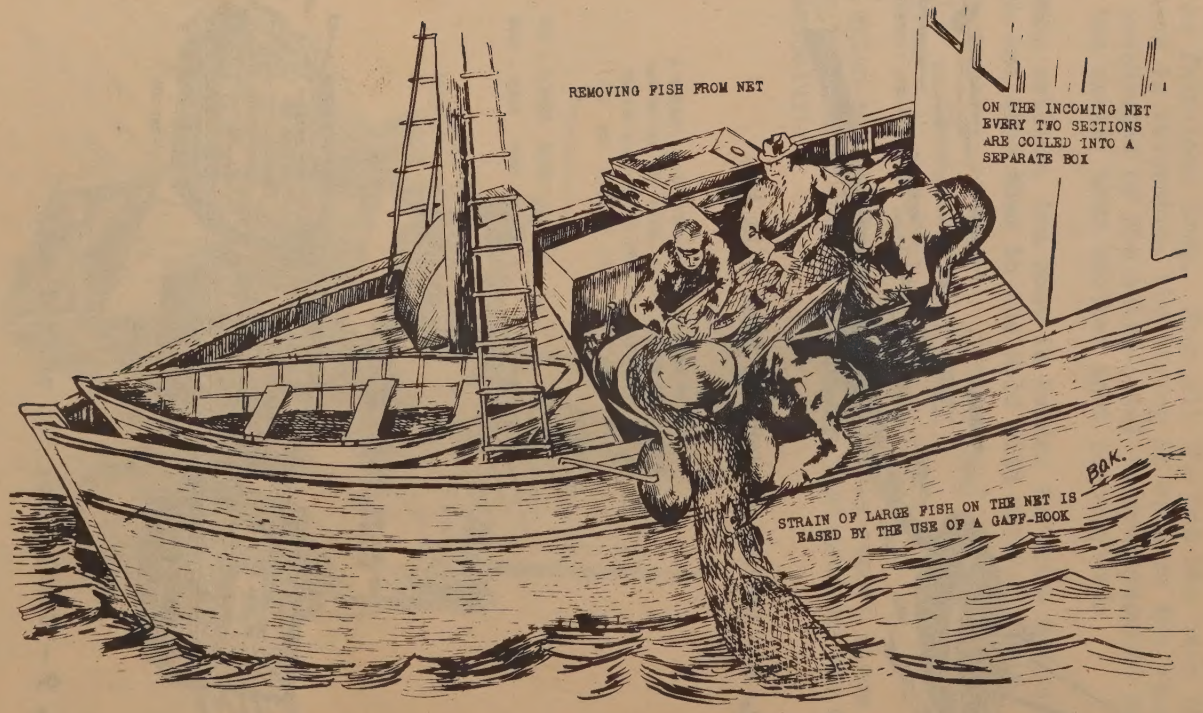
REMOVING FISH FROM NET
ON THE INCOMING NET EVERY TWO SECTIONS ARE COILED INTO A SEPARATE BOX
STRAIN OF LARGE FISH ON THE NET IS EASED BY THE USE OF A GAFF-HOOK
B.A.K.

Fig. 10 - Hauling in Net